1:Beals E-5 (1940-1941)1946 NU34 Tarasco NU34
Sierra Tarascans

either from the sides of public roads or from fields, with the permission of the owner. It is dug with pick and shovel, put in bags, and taken into town on muleback.

Adobes (adóbi) and adobe mortar are made from any convenient fine earth mixed with manure. In some towns dry pine needles (*"huinomo"*)[6] or wheat or barley straw is used. The mud (adímu) for adobes is mixed in a depression in the ground. Dry earth is first mixed with manure and water is added, in the proportion of 10 loads (*carretilladas*) of earth, half a sack of manure or straw, and 10 five-gallon tins of water. The mud is then mixed with a spade for about 3 hours.

A wooden frame (*marco* or *adobera*), the size of the brick to be made, is now placed on carefully leveled ground. Mud is placed in the frame and pressed down well with the hands to insure complete filling of the space. The frame is now lifted off and washed in preparation for making the next adobe. The adobes are allowed to dry for 8 days, first in the original position and then on edge.

The usual size of adobes is 60 by 40 by 10 cm., or 2½ spans long. Cherán makes this size and also a brick 3 spans in length.

WATER SUPPLY

Cherán has a better water supply than most Tarascan towns, but it is still far from adequate. The larger of the barrancas through town often has flowing water, but this is used only for watering animals and washing clothes, as it is not considered pure enough to drink. At one spot, however, there are a number of small springs in the walls of the barranca. These have been improved by building cement tanks to accumulate the rather small flow, and people from the *barrio* of Parícutin and some other nearby residents obtain their water from the springs.

About 10 years ago an aqueduct was built to large springs near the base of the mountain, El Pilón, a distance of 15 km. (9 mi.). A 2-inch pipe line was laid, but the pipe reached only to the edge of town. From the end of the pipe the water is carried to the center of town by an arrangement of hand-hewn wooden

[6] Words regarded in Cherán as Spanish but which either do not appear in dictionaries or have special local meanings are placed in quotation marks.

256 arrangement guarantees an adequate number of customers each day a mill is operating.

256 The miller must have some mechanical knowledge as well as capital and business ability.
902 Most of the mills are driven by an old automobile engine converted to operate on gas produced by a charcoal burner, usually made from an old oil drum. A belt drive transmits power and reduces the speed. Usually the owner (or manager in some cases) supervises the motor and the gas burner and an employee or member of the family feeds the maize into the mill and collects the charge, 1 centavo a kilo. In one case a woman occupied this post, but most of the mill operators are men.

Except for a few very poor families, everyone in Cherán now patronizes the mills. Each mill serves from about 330 to 360 customers a day.

Wheat threshing.—One wood-burning steam-
407 driven threshing machine has operated in Cherán for several years. The machine is stationary (although it could be moved, it is too cumbersome to do so), and the customers bring their wheat to the machine. Two tenders, who feed the wheat into the machine, and a water carrier are required besides the operator. Firewood is purchased. Exclusive of interest on the investment and repairs, the operator nets about 25 pesos a day above operating expenses.

In 1940 a smaller gasoline-driven thresher, which could be moved from house to house, was said to have made considerable inroads on the trade. However, as the bulk of the Cherán wheat is still threshed by hand, there seemed to be ample business for both threshing machines.

Painters and plasterers.—This is a rare occu-
338 pation followed by two or three men on a part-time basis. Only a minority of the houses of adobe or stone are plastered, and few of them are painted. The pay is fairly good, but the best worker probably does not put in more than 90 days' work a year. Brushes and stencils are used in painting.

Masons.—As the house owner normally pro-
333 vides all materials, the mason sells only his services. His equipment is a trowel, hammer, a board frame for holding mud mortar, a shovel for mixing mortar, an ax to cut poles for

1:Beals E-5 (1940-1941)1946 NU34 Tarasco NU34
[p.476] Sierra Tarascans

scaffolding, and string to line up the walls. Perhaps a dozen men do masonry, mostly as a secondary occupation. Work is usually charged for on the basis of square meters of wall.

Barbers.—Most men in Cherán now have their hair cut by a barber. There are two barbers in town regularly, and more come to town during fiestas. The Cherán barbers also visit nearby towns during fiestas. During the middle of the week they have little trade.

Formerly men cut each other's hair for nothing in the bull ring on Sundays, using only scissors. The barbers have clippers as well and also razors for shaving, although there is not much demand for the latter. One barber is not a native; the other learned the trade in the United States.

Water carriers.—In most households the women bring the water from the fountain or aqueduct in ollas carried on their shoulders. However, for any commercial use (*nixtamal* mill, masonry, the threshing machine), water is carried by men. In addition, there is one man who makes his living carrying water for storekeepers, whose wives may be too busy helping in the store, and for a few families who are somewhat Mestizoized and the husband has decided the work is too hard for the women.

Interestingly enough, the men's method of water carrying is entirely different from that of the women. Men carry water in two 5-gallon cans suspended from the two ends of a pole which is supported on the shoulder. This rigid dichotomy is observed even in families where one of the men or boys brings the bulk of the water. If the women need to bring additional water, they always use ollas and make several trips.

FOOD PROCESSING AND DIET

Consideration of food processing in this section is confined primarily to household activities. Commercial processing of food for sale, such as baking, butchering, and ice cream making, will be considered later.

The storage of food is confined primarily to maize, wheat, beans, and broadbeans (*habas*). Except for small supplies for immediate use, stores are kept in the house, usually in the loft. Maize is stored on the cob. Wheat, beans, and similar seeds are stored in gunny sacks or in

1:Beals E-5 (1940-1941)1946 NU34 Tarasco NU34
[p.70b]

322 *Wood turning:*
433 *Equipment:*
434 Lathes
Saws
Chisels

Product:
Chocolate beaters

Cost of materials:
No data; the small quantity of madroña wood used is probably a minor factor.

Labor:
[435] About 25 to 30 beaters are made in a day's work. Sale price at 50 centavos per dozen ..... $1–$1.25

Comment: Considering the costs of materials and the time involved in selling the product, returns for labor probably are under $1 a day. Only one man in Cherán follows this trade.

MINERAL PROCESSING AND USE

339 *Brickmaking and tilemaking:*
433 *Labor* (per 1,000 tile or brick):
434

	Days
Getting and mixing clay	2
Cutting and hauling wood	1
Shaping	5
Loading kiln	1
Total	9

Other costs (in kind):
Rent of building and right to dig clay on public lands (paid to *municipio*), 10 percent of product value:

Tile, per 1,000	$3.00
Brick, per 1,000	3.20

Sales prices:

[435] Tile, per 1,000	$30
Brick, per 1,000	32
Gross profit, tile, per 1,000	27
Daily profit per worker	3

Comment: While brick bring a slightly higher price, there is a greater loss in firing. Consequently, profits are about the same as for tile. The demand for brick or tile is not sufficient to employ two men full time. The wage return is hence misleading, indicating what might be possible if demand provided steady labor. [465] The fact that both tilemakers took jobs on highway construction crews whenever possible at $1 a day suggests that income over a long period of time is much less than is indicated. On the other hand, the tilemakers probably average a higher annual income than do unskilled landless farm laborers in Cherán.

333 *Masonry:*
433 *Equipment:*
434 Trowel ("*cuchara*")
Short shovel
½-pound iron mallet ("*marro*," maso)
2-pound sledge with pointed ends ("*picadera*")

Production:

333 Less than 1 meter to nearly 2 meters a day

433 *Price:*

434 From 80 centavos a meter to $1.25; about $1 a meter seemed most common

[435] *Average return:*

From 80 centavos to $1.50 seems common

Comment: Essentially the mason's wage is clear profit. Replacement of tools is undoubtedly a minor factor. Attractive as the wage is, a mason is idle much of the time. It is doubtful if masons earn enough to live on without also farming or working as laborers. Some masons are also butchers, plasterers, or *tejamanil* makers.

Stonecutting:

324 *Tools:*

433 2-pound iron mallet

434 Chisels

Calipers (value unknown)

Labor:

Nixtamal grinding stones (pair)	3 days
Door bases (pair)	1 week

Sales price (gross profit):

[435]

Nixtamal grinding stones (pair)	$9
Door bases and sills (each)	10

Comment: The figures suggest a $3 a day gross income, but stonecutters work only to order and do not work regularly.

TEXTILE MANUFACTURE

285 *Tule mats:*

Costs:

433

434

Tules at Erongaricuaro, per bundle	$0.25
Rent of burro, 3 days	1.00
Total cost of 10 bundles of tules (1 burro load)	3.50

Labor:

	Days
Getting tules	3
Weaving 13 mats	6½
Selling mats	2½–3
Average total time	12

[435]

Sales price at 60 centavos each	$7.80
Gross profit	4.30
Daily profit per worker	.35 plus

Comment: Except for one woman, mat making is a side line and only one a day is woven. The figures given above represent the single case where a woman spends all her time at mat weaving. Actually, this woman has a slightly higher income, as her mother buys the tules. On the other hand, two people are supported by the work, for the weaver has to rely on the mother to perform most of the household duties.

BUILDING MATERIALS
AND THEIR SOURCES

313 by a chalk line, and then placed on a platform of
412 poles, sometimes with a pit underneath.[2]

Shakes, *tejamanil*, are made from both pine and fir. Fir shakes are preferred as they last longer despite breaking more easily. Trees used to make *tejamanil* must be straight-grained. The trunk is cut in sections with saw or ax; each section is then split lengthwise with wedges to produce a number of pieces, usually 8, each 4 fingers wide at the bark edge. These pieces are then split into 16 shakes. A special machete is used to start the split, which is then completed with a thin metal or wooden tool.

313 Several types of shakes are made. In Anga-
huan, a shake 5 *cuartas* (40 in.) long and 7 inches
438 wide is made to sell in Zamora and is called Zamorano. One shake 4 *cuartas* (32 in.) in length by 4 inches in width, called "little shake" (tasámbani sapírati), is sold in Uruapan, while one called "long shake" (tasámbani iórati), 6 *cuartas* (48 in.) by 1 *quarta* (8 in.), is used in the town itself. Cherán, on the other hand, uses a shake called "thick shake" (tasámani tiápiti), 5 *cuartas* (40 in.) in length. This is the size used in most Tarascan towns. Shakes are occasionally sold by the hundred, but the most common unit is a bundle of 400 (irépita).

Master carpenters may use an elaborate variety
412 of modern tools for woodworking and house building. However, everything may be done in woodworking with ax, adze, saw, drill, chisel, and wooden wedges, and many persons work only with these tools.

ADOBE BRICKS

Adobe bricks are usually made from suitable
339 earth near the village by specialists. The earth is mixed with manure and water to the proper consistency, then shaped in wooden forms. Two sizes of brick are made, one 3 spans long, one 2½ spans long. Adobes are laid by a mason in a mortar of adobe and manure. Because of the moist
333 climate, adobe walls always rest on a foundation of stone masonry laid in adobe mortar; the foundation may extend as much as half a meter (20 in.) below the ground surface.

[2] A fuller description of lumbering techniques will be given in a general monograph on Cherán in preparation.

339 In some towns, dried pine needles ("*huinomo*"), wheat, or oat straw are used in place of manure.
[192] In the Sierra, adobes are called adóbi; in Ihuatzio, on Lake Pátzcuaro, iauárukata.

STONE

316 Masonry is made of assorted-sized rocks brought from a quarry in the west side of the cinder cone
333 on the northwest edge of town. The stone is a porous soft reddish lava, easily broken or dressed roughly with a hammer. It is carried from the
[497] quarry on burros. The rocks are used for all types of masonry walls. Usually large sizes are employed near the bottom and to make the external faces of the wall; smaller stones are used to fill up the spaces, and usually all external surfaces are filled with small stone spalls set in the mud mortar.

316 Large stones used for foundations are a hard gray lava from the arroyo north of town or from the slopes of a cinder cone northeast of town.
[324] The same rock is employed for finished pieces of

[continued on p. 10b]

TYPES OF STRUCTURES

WOODEN STRUCTURES

343 Three main kinds of wooden structures are built. These are the "*troje*," or house (trója; in Angahuan, tarímba), really a storehouse in use, the kitchen (kosína), and sheds used for storing fodder or sheltering animals. Normally, a mas-
[335] ter carpenter is employed; he usually works for an agreed price and hires a helper.

The "*troje*" is a rectangular structure, nearly square, consisting of one room with a loft over it (fig. 3; pl. 2, upper). The door is always in one of the long walls and there is usually an overhang of the roof, supported on pillars, forming a veranda on this side. Usually the flooring of the first floor is extended to form a floor for the veranda (fig. 3; pl. 4, lower, left).

343 The "*troje*," or house, is elevated on large stones
335 (or stone pillars in some towns), usually 9 in number, one at each corner, one in the middle of each side, and one at the center of the floor. Upon the stones go four interlocking foundation beams, "*polines*"[3] (pitékua), and a crosspiece destined to support the middle of the floor, the "*atravesaño de*

[continued bottom page 10b]

[3] Also "*yeritas*," because they are usually made of heartwood (*ts'ítsi*).

342 they are called round houses (k'utá uiíṗiti). The
335 latter term is known but not used in other towns.

In Capacuaro occur storehouses, called "*huacal*" (uakáli), made of four walls of interlocked logs or planks with a simple roof of two sheds (pl. 6, lower, right). In some other towns, the same type is made in the fields. The structures are used to store wheat before thrashing or to store straw for animals.

Occasionally, houses built on the edge of the street have the street wall of stone or stone and adobe, while the remaining walls are of wood.

In the Lake Pátzcuaro and La Cañada towns, a few old "*trojes*" are found. They resemble those of the Sierra but, except for two cases in Janicho, the roof is different. At either short end a triangular structure of adobe, "*capisayo*," is erected on the wooden walls and sustains a ridge pole. Rafters run from the ridge pole to the "*planchas*," or plates, in front and back. Stringers attached to the rafters support a roof of either shakes or tile (pl. 6, middle, left).

ADOBE-AND-MASONRY HOUSES

342 In its simplest form, the house with walls of
● 333 stone (ȼanȼákata), "*casa de pared*," or stone and adobe, has one rectangular room with the door on one of the long sides. Occasionally, houses of more than one room are encountered or even of two stories. The latter seem very recent and commonly belong to Mestizos.

Masonry is always used as the foundation, "*rehenchido*," of an adobe wall. In some cases,

342 masonry is used to complete a wall; in others,
333 the upper part of the wall is completed in adobe brick. In the latter case, the stonework wall is carried up at least half a meter (20 in.) above ground level.

Masonry is always extended about 50 cm. (20 in.) below the ground surface, whether used only as a foundation or for the complete wall. The [316] stone used is the volcanic tufa brought from a nearby cinder cone The walls are usually about 50 cm. (20 in.) in thickness. Larger stones are set with relatively flat faces outward. The flat faces will be dressed if this is imperative but no other shaping is done. To fill in irregular spaces in the wall face, stones of proper shape with one flat face are sought in the pile of materials. Small stone spalls are also employed abundantly to fill in any spaces between rocks. The mortar is of adobe mud mixed with animal dung, and the central part of the wall is filled in with irregular rocks and considerable quantities of mortar.

If the upper part of the wall is to be of adobe bricks, these also are laid in adobe mortar (fig. 13). Two sizes of brick are employed; the larger size results in a somewhat thicker wall. The mortar is the same as that employed for masonry. In the Sierra and on those islands in Lake Pátzcuaro where adobes are not made, the stone base is usually higher than elsewhere.

In construction, a professional mason is employed. He erects a frame to which strings are attached to keep the wall straight. He also uses a plumb line to keep the wall vertical. A trowel

333

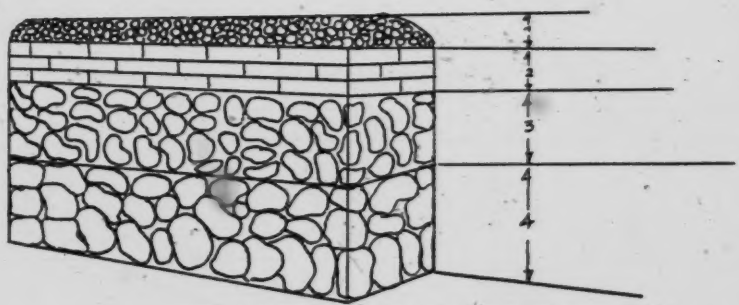

FIGURE 13.—Well-made masonry and adobe-brick wall in Cherán.

[p. 17c]

342 and a hammer are the other needed tools. As the
333 wall increases in height, a crude scaffolding is erected, usually on each side of the wall, and the mortar is placed on a small portable platform of planks (pl. 7, upper, left [8]).

[338] Adobe-brick walls are frequently finished with a coating of adobe plaster, plentifully mixed with animal dung if the wall is to be used for a house. Somewhat less frequently, a lime-plaster coating is used to cover the wall.

342 In Cherán, usually only front and side walls of
335 houses are made of brick or masonry. The back wall, and sometimes one side wall, will be of upright planks fitting into grooves in horizontal beams at top and bottom. Doors have door-jambs of stone and the doorposts rest on a stone base with a mortice to receive a tenon on the lower part of the post. A lintel at the top is morticed to the doorposts and extends beyond them on either side, being surrounded by masonry or bricks and supporting the wall if it continues above the door. Windows are made in the same way, but no stone is used.

Upon the leveled tops of the wall are laid wooden plates, or "*planchas*" (in this case also called "*plantillas*"). Across these are square joists, extending 2 or 3 feet beyond the walls. The ends are ornamentally carved. Across the ends of the joists, a second plate is sometimes laid and fastened to the joists with wooden pins, which sometimes pass through the joists and extend below them. The rafters are set into sockets

[8] The making of adobes and tiles will be described in another paper.

[p. 18a]

342 occasionally are of brick or cement but ordinarily are of wooden planks. There is also usually a kitchen of wood in addition to the masonry-adobe structure. The latter is more difficult to maintain in order and there is a reluctance to smoke up the interior.

423 Certain customs connected with the erection of masonry-adobe walls should be mentioned.
333 Often a division wall is erected between the forward part of two lots which may later be used as a house wall by either or both lot owners. If the cost of such a wall is shared, half the wall rests on the land of each owner. As frequently happens, however, one householder pays all the cost. In this case, the entire width of the wall is on the land of the person not contributing money. The latter, however, may use the wall as part of a house wall at any later time.

342 In the Lake Pátzcuaro and La Cañada regions,
333 house walls are almost always of adobe on a low
335 stone-masonry foundation. Usually the houses have a veranda or corridor. The walls are erected as described. Five heavy planks then serve as plates, "*planchas*," one on top of each wall and one supported by pillars at the outside of the veranda. Sometimes there are capitals, *zapatas*, between the pillars and the plate. The plates at the two sides extend from the wall to the pillars, or the side walls are extended to the edge of the corridor. In this case, no corner pillars are needed (pl. 7, lower, right).

Upon the plates on the two shortest walls is erected a triangular adobe structure, "*capisayo*" (kenzéjtakua). Across the other plates are laid joists, in the more elaborate structures extending well beyond the rear wall and edge of the corridor, and carved at the ends. If the joists do not extend beyond the wall and corridor, the plates on the short sides may go only from the outer edge of the corridor to a point part way to the opposite side of the house. In this case, the "*capisayo*" may be partially an upward extension of the house wall.

342 If the loft space is not used, shakes may be
335 laid on the joists to form a ceiling; often this is done only over the veranda. Alternatively, a plank floor may be laid.

Should the house lack eaves, two heavy planks, "*pisos*," are placed on the ends of the joists. Upon these rest the rafters. If the eaves pro-

342 ject, then the "*pisos*" are usually higher, sup-
335 ported by the adobes of the "*capisayo*," and another heavy plank is placed on the ends of the joists. The space between the wall and the ends of the joists is usually covered with shakes. The lower end of the rafters is supported by the "*piso*," the upper by a ridge pole (pirĵ*ɟ*akua in Ihuatzio). The latter in turn rests on two wooden pieces, "*burrito*," or "*zoquete*," forming the top of each triangular adobe "*capisayo*" (pl. 7, lower, right).

Although the preceding roof type is the most common, simpler types are known. In some cases, one wall is lower than the opposite wall and a single shed roof is formed by sloping joists. It should be observed that similar types of construction are used in La Cañada and at Tarecuato. Moreover, examples of all types of stone-
[171] and-adobe construction may be found in nearby Mestizo towns.

SUPPLEMENTARY STRUCTURES

351 Supplementary structures consist of fences,
333 gates, and sheds for storage or for shelter of animals. Fences facing on streets are the most elaborate as a rule. They may consist of dry rock walls made by the house owner, but in the central parts of town are almost always of masonry or masonry topped with adobe brick (pls. 2, lower; 3, right). They are called sérka. The construction differs in no way from that for house walls. The top is covered with shakes held down with a wooden stringer and stones. Adobe fences are most common in the Lake Pátzcuaro and La
351 Cañada regions. Often fences of poles (ua*ɟ*ótakua)
335 are employed to divide lots, or especially in the outlying sections of town, along the streets (pl. 3, left). Poles may also be used to raise a masonry or adobe-brick wall somewhat higher, in which case a row of shakes will usually be employed to give privacy as well. No orthodox construction is used for pole structures. One attractive but not very practical fence was made of dry cornstalks bound neatly at top and bottom to small poles. A fence of upright poles or planks is called *ɟ*irindikua.

Gates are usually quite elaborate and serve to close openings to the street. Commonly, the gate is a well-made door, purchased from a carpenter, and swinging from two substantial upright posts. These posts are set in the ground and in addition

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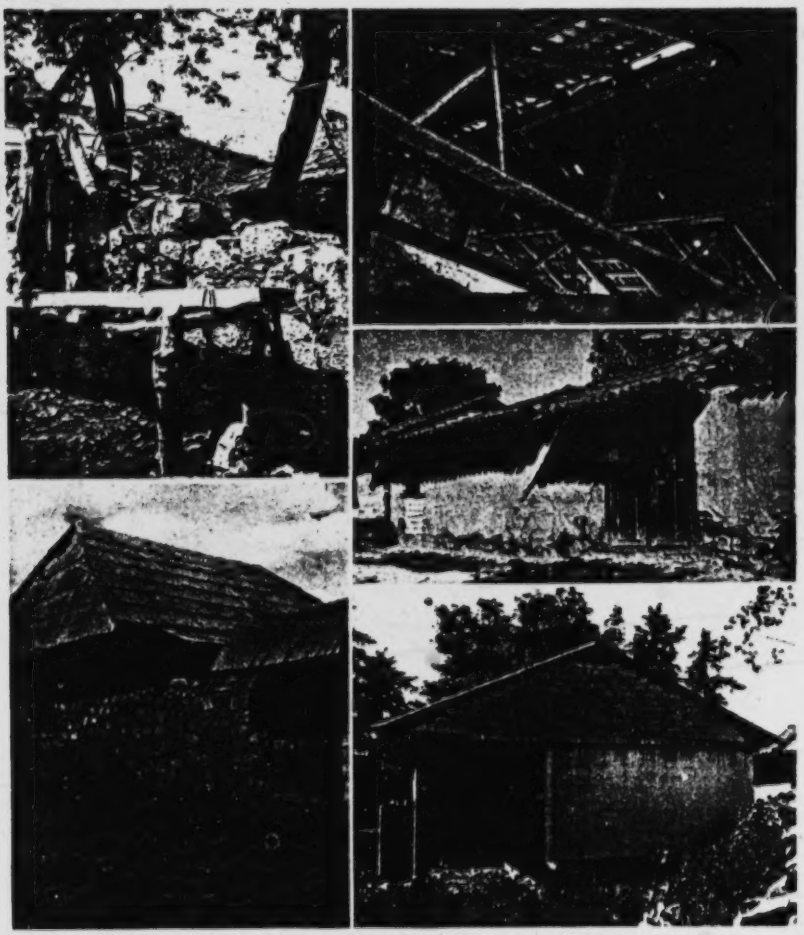
[333]



Upper (left): Mason at work in Cherán. *Upper (right)*: Fairly elaborate roof construction at Ihuatzio typical of adobe structures. *Middle (right)*: Gate roofed with tile, Ihuatzio. *Lower (left)*: Stone house at Paracho with shake roof of "*troje*" style. *Lower (right)*: Ihuatzio house with veranda, seen from one end. The "*plancha*," or plate, is carried clear across the house in this case and doubled at the ends. The wooden support, or "*barrita*," for the ridge pole is clearly seen.

[End plate 7]